PB85-213916

Superfund Record of Decision (EPA Region 5)
Berlin and Farro Site
Swartz Creek, Michigan, February 1984

(U.S.) Environmental Protection Agency
Washington, DC

29 Feb 84

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R05-84/003
February 1984

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EPA

Superfund Record of Decision:

Berlin & Farro Site, MI

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Berlin & Farro Liquid Incineration site occupies 40 acres approximately 3.5 miles south of the City of Swartz Creek, Michigan. A liquid waste incinerator was operated at the site from 1971 until the late 1970's, during which time liquid wastes were incinerated, stored in open lagoons and underground tanks and poured into agricultural drains. Solid wastes, contained primarily in crushed drums, were buried in various on-site locations.

The selected alternative to mitigate the uncontrolled hazardous waste problem at the Berlin & Farro site involves four areas. They are: excavation of the existing drum landfill and disposal of sludge, crushed drums, liquid wastes and visibly contaminated soil at a RCRA facility; solids to be landfilled and liquids to be incinerated. Also, excavation of the paint sludge trench and disposal of sludges and visibly contaminated soil at a RCRA facility. Also, excavation of the agricultural drains leaving the site and miscellaneous areas of visible contamination, and disposal of wastes, sludge and visibly contaminated soil at a RCRA facility. Supplemental sampling will be performed to determine if waste has migrated below visibly contaminated areas.

(Key Words are on attached page.)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Berlin & Farro Site, MI Contaminated media: sw, soil, sludge/drum wastes, air Key contaminants: PCBs, solvents, paint sludges, VOCs, C-46, C-58, C-56, C-66, metal hydroxides		

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Record of Decision
Remedial Alternative Selection

Site: Berlin & Farro Liquid Incineration
Swartz Creek, Michigan

Documents Reviewed.

I have reviewed the following documents describing the analysis of cost-effectiveness of remedial alternatives for the Berlin & Farro site:

- Focused Feasibility Study, Berlin & Farro Hazardous Waste Site, Swartz Creek, Michigan, CH_2M-Hill, August 31, 1983
- Summary of Remedial Alternative Selection
- Letter from Ronald Skoog, Director, Michigan Department of Natural Resources
- Berlin & Farro Hazardous Waste Site Air Monitoring and Sampling Supervision, April-June 1983, Swanson Environmental, Inc.
- Public comments and recommendations
- Responsiveness Summary

Description of Selected Remedy

- Excavate the existing drum landfill, paint sludge trench, agricultural drains, and miscellaneous contaminated areas to remove sludge, liquid, crushed drums and visibly contaminated soil.
- Separate PCB solid wastes from non-PCB solid wastes. Transport wastes to off-site approved disposal facilities.
- Transport PCB liquid wastes, if any to approved off-site incinerator.
- Pump non-PCB liquid wastes from the drum landfill (approximately 1.6 million gallons) and transport to an approved off-site incinerator.
- Backfill the areas with uncontaminated relatively impervious soil if no additional remedial actions are needed, or install a temporary cap over the excavated areas pending determination of extent of contaminated soil below the areas and selection of an appropriate remedy.

Declarations

Consistent with the Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300) I have determined that the excavation and off-site disposal or destruction of hazardous substances in the drum landfill, paint sludge trench, agricultural drains and miscellaneous contaminated areas is a cost-effective remedy necessary to prevent or minimize the release of hazardous substances so they do not migrate to cause harm to public health or welfare, or the environment.

I have also determined that the action being taken is consistent with permanent remedy at the site, and is appropriate when balanced against the availability of Trust Fund monies for use at other sites. In addition, the off-site transport, destruction, and secure disposition is more cost-effective than other remedial actions.

The State has also requested approval of excavation and disposal of contaminated soil under the landfill, paint sludge trench, agricultural drains, and several other areas of contamination. I have determined that sufficient data are not available to undertake those actions at this time. However, I am approving the removal of the drum landfill, hazardous wastes in the paint sludge trench and agricultural drains and identified contaminated areas plus visibly contaminated soil in these areas since delay would create an unnecessary threat to public health or the environment. Specifically, there is a significant risk that organic wastes will volatilize at a high rate if not removed prior to warmer weather, posing a threat to nearby residents.

Following completion of this action, the State will conduct field testing to determine the extent of contaminated soil below the landfill, paint sludge trench, agricultural drains, and in several isolated areas of contamination. EPA and the State will evaluate the additional data and I will make a further determination on the appropriate remedy for those areas.

2/29/84
Date

Lee M. Thomas
Assistant Administrator
Office of Solid Waste & Emergency Response

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 24 1984

OFFICE OF
GENERAL COUNSEL

MEMORANDUM

SUBJECT: Record of Decision for Berlin and Farro Site

FROM: Lisa K. Friedman
Associate General Counsel
Solid Waste and Emergency Response Division (LE-132S)

TO: Lee M. Thomas
Assistant Administrator
Office of Solid Waste and Emergency Response

I have reviewed the Record of Decision for the Berlin and Farro site and believe that, except as noted below, it does not raise any significant legal issues. As you may recall from the meeting presenting the ROD, we initially had legal concerns with the criteria used to select off-site disposal as the cost-effective alternative. We have worked with your staff to address these concerns in the ROD, and now believe that the decision is generally defensible.

As currently drafted, the ROD relies on hydrogeologic concerns with the Berlin and Farro site to discount the effectiveness of on-site disposal. These concerns go beyond the location criteria currently used for siting landfills in the RCRA regulations. However, I understand that you are moving toward expanding the RCRA location criteria to include similar factors. That may ultimately cure any conflict between the Berlin and Farro decision and the RCRA Subpart C regulations. For the short term, of course, you will need to continue to consider hydrogeologic concerns, when appropriate, in the selection of remedial alternatives under CERCLA, to be consistent with the Berlin and Farro decision.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Record of Decision for Approval of Remedial Action at the Berlin and Farro, Michigan Site

FROM: Frank Biros, Director
Technical Division
Office of Waste Programs Enforcement (WH-527)

TO: William N. Hedeman, Jr., Director
Office of Emergency and Remedial Response (WH-548E)

The Record of Decision for the Berlin and Farro, Michigan site has been reviewed by my staff.

I concur ✓

I do not concur _____

I concur with the attached conditions _____

Date 2-14-84

Comments:

✓

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 15 1984

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Record of Decision for Approval of Remedial Action at the Berlin and Farro Site

FROM: Bruce R. Weddle, Acting Director
Permits and State Programs Division (WH-563)

TO: William N. Hedeman, Jr., Director
Office of Emergency and Remedial Response (WH-548E)

The Permit Assistance Team (PAT) received the Record of Decision (ROD) for the Berlin and Farro site the day before the ROD meeting with Lee Thomas. I am sure that you can understand that this does not provide adequate time for review. Because of the lack of time for review, I am unable to concur with this action. I request that in the future the PAT be given sufficient time to review these complicated documents.

Based on a quick review, there appear to be questions about whether this site is subject to the RCRA standards and whether the extent of cleanup and "closure" on site will satisfy those standards. My staff is available to work with your staff to resolve any such issues.

cc: John Skinner
Peter Guerrero
Terry Grogan
Sam Gutter

ASSISTANT ADMINISTRATOR
RECORD OF DECISION
BERLIN AND FARRO LIQUID INCINERATION SITE

PURPOSE

- To select the appropriate remedial action at the Berlin and Farro Liquid Incineration site that is consistent with the requirements of CERCLA and the NCP. The Assistant Administrator for Solid Waste and Emergency Response has been delegated the authority for that approval.

ISSUES

- There is a high degree of public and Congressional concern that the schedule for implementation of remedial actions will be delayed. Due to the high volatility of the hazardous organic chemicals disposed on the site, it is technically advantageous to implement this project during cool weather. This necessitates that work begin on the site within the next few weeks.

- Given the history of State actions at the site, OERR is concerned regarding State management of this project under the cooperative agreement. HSCD has recommended to Region V that the Corps of Engineers provide Federal oversight during the remedial activities.

SITE HISTORY AND RESPONSE ACTIONS

- The Berlin and Farro waste disposal facility is located in Swartz Creek, Michigan. The site was used for incineration and/or disposal of hazardous wastes between 1971 and 1981. The facility operated under a State permit during some of this time, however the operating permit was revoked after numerous violations were documented. Title to the site was deeded to the State in 1981 for non-payment of back taxes.

- The approximately forty acre site is a former industrial waste disposal facility. The original site included a deteriorated incinerator, 2 large sludge lagoons, 5 underground waste storage tanks, a drum landfill, a paint sludge trench, 4 subsurface contaminated agricultural drains and numerous other smaller isolated disposal areas.

- In 1981, the site was declared a toxic waste emergency by the Governor of Michigan. Approximately 4.5 million dollars in State funds has been spent for cleanup actions and enforcement efforts at the site. Most of these funds became available through a special appropriation for the site approved by the state legislature.

- Most of the State funds have been used for excavation and off-site disposal of lagoon sludges contaminated with hexachlorolyclopentadiene (C56). The majority of this work was done under Genesee County court orders issued to the State in November 1982 and April 1983. The work was conducted by the Michigan Department of Natural Resources (MDNR) and was outside the approved scope of the Superfund Cooperative Agreement.

- EPA has spent approximately 1.04 million dollars for emergency response actions at the site. These actions included fencing, runoff control, and off-site disposal of 3,600 drums which had been excavated by the MDNR and left on the surface of the landfill.

- A Superfund cooperative agreement was awarded to the MDNR in July 1982 for remedial activities at the site. The amount of the award was $1,033,844. The scope of work included a remedial investigation, feasibility study and a remedial action to excavate and dispose of 4 underground waste storage tanks and adjacent contaminated soils. (A ROD was approved for this remedial action in October 1982.) The MDNR has removed the underground tanks and contaminated soils ($746,000) and conducted a preliminary hydrogeologic study ($125,000). The report is not conclusive and additional studies must be conducted to define the hydrology at the site and the extent of ground water contamination.

ENFORCEMENT STATUS

- Negotiations with potential responsible parties (PRP's) have been ongoi g since October 18, 1983. A "final" meeting was held on February 14, 1983, to determine whether the PRP's, EPA and the State could agree to a settlement prior to approval of the ROD. If a settlement agreement is not reached, a CERCLA Section 106 order will be issued to the PRP's. If a positive response to the order is not received, OWPE will give an enforcement release for fund obligation.

PROPOSED REMEDIAL ACTION

- The Focused Feasibility Study (FFS) was conducted to evaluate source control measures in the major areas contributing to off-site migration. These were:

    - Drum landfill (33,000 drums, 1.6 million gallons of liquid waste, 24,000 cubic yards of solid wastes)

    - Paint Sludge Trench (3,900 cubic yards solid wastes)

    - Agricultural Drains (3,300 cubic yards of solid wastes)

    - Isolated Areas of Contamination (2,000 cubic yards solid wastes)

- The following options and costs were evaluated for solid and liquid wastes after screening of preliminary alternatives:

Alternatives	Estimated cost ($M)
On-Site landfill for solids and solidified liquids.	$ 8.86
On-Site landfill for solids and on-site treatment of liquids	$ 9.58
Off-Site Disposal of Solids and Liquids	$ 9.08

- On-site disposal is slightly less expensive than off-site disposal; however, the high ground water table and permeable soils cause off-site disposal to be a more cost-effective remedy for this site.

- The off-site alternative includes incineration of all liquid wastes, thereby providing permanent destruction of these wastes.

- Public comments received generally support the proposed alternative. No comments recommended a different alternative, although some questioned the phased approach of the site cleanup.

- The recommended cost effective remedial alternative is off site disposal of solid and liquid wastes. The solid wastes will be disposed in RCRA approved facilities and the liquid wastes will be incinerated.

- The estimated cost for this alternative is $9.08 M. The actual amount of funding to be initially obligated will be less than this amount because the MDNR has received a low bid of 6.28 M for the total project. (See next bullet).

- The MDNR has submitted a cooperative agreement amendment request for funding to implement the recommended remedial actions. The MDNR completed design work for the proposed project in November 1983, and has formally advertised for a contractor. Upon award of the cooperative agreement amendment, the MDNR will sign the contract (6.28 M) for implementation of the approved remedial actions.

- A bill to appropriate the required State 10% cost share was signed by the Governor in January 1984.

FUTURE REMEDIAL ACTIVITIES

- Upon completion of this remedial action, the following Federal lead remedial planning activities will be conducted:
  - Remedial investigations, including contaminated ground water and soils characterization, will be completed. Estimated cost - $161,000.
  - A feasibility study will be conducted to evaluate alternatives for final site cleanup. Estimated cost - $131,000.
- Based on the recommendations in the feasibility study, a ROD may be prepared for additional source control and/or off-site remedial actions.

NEXT STEPS

Action	Date
° Approve ROD (AA-OSWER)	February 15, 1984
° Issue CERCLA 106 (Region V)	February 17, 1984
° Enforcement release (OWPE)	March 9, 1984
° Amend cooperative agreement (OERR/GAD)	March 9, 1984
° Initiate remedial action (MDNR)	March 12, 1984
° Initiate additional remedial planning activities (Region V)	March 1984
° Complete remedial action (MDNR)	August 10, 1984
° Complete remedial planning activities and prepare ROD for recommended remedial actions (Region V)	December 1984/ January 1985

Summary of Remedial Alternative Selection
Berlin & Farro Liquid Incinerator
Swartz Creek, Michigan

Site Location and Description

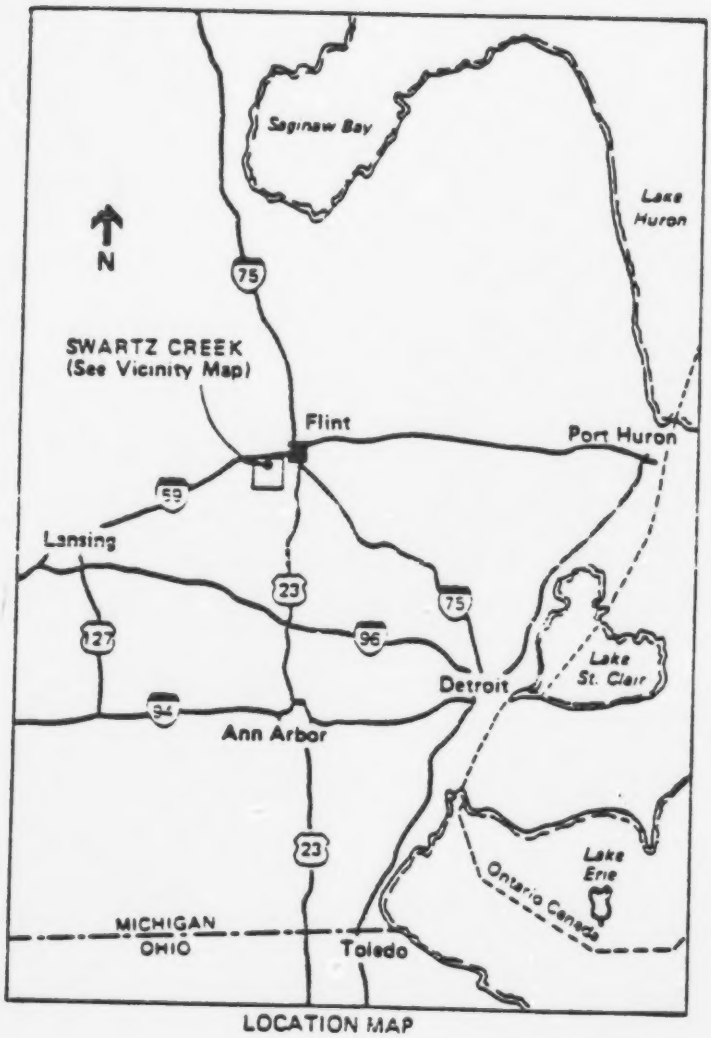
The Berlin & Farro Liquid Incineration uncontrolled hazardous waste site, occupies approximately 40 acres and is located 3 1/2 miles south of the city of Swartz Creek, Gaines Township, Genesee County, Michigan at 8322 Morrish Road (see Figure 1). The surficial geology of the area consists of glacial fill, characterized as a heterogeneous mix of sand, silt, clay, gravel, and boulders. Bedrock is encountered at depths ranging from 125 to 156 feet. Land use patterns in the area consist of agricultural row crops, small deciduous woodlands, and a residential area northeast of the site. Approximately 150 people reside within a 1/2 mile radius of the site. Due to the potential for hazardous emissions (specifically cyanide), the majority of these people were evacuated during excavation operations conducted by the Michigan Department of Natural Resources (MDNR) during the summer of 1983 and have since returned to their residences.

Residential and commercial wells exist in both the bedrock and unconsolidated geologic formation mentioned above. The direction of movement in the bedrock aquifer is generally to the northwest. Due to the complexity of the geologic and hydrologic conditions in the unconsolidated materials (e.g. discontinuous bearing sand bases interspersed in a mix of silt, clay, gravel, and boulders), ground water movement is not limited to one direction.

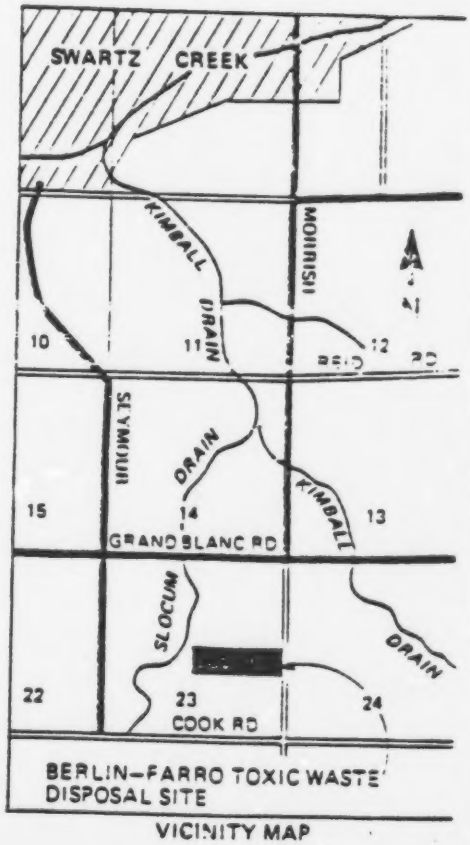
The scope of Focused Feasibility Study (FFS) covers the solid and liquid hazardous materials contained on site in the drum landfills (large 1.23 acre area and two small .09 and .08 acre areas), a paint sludge trench (.2 acres), two subsurface agricultural drains containing approximately 3,300 cubic yards of contaminated soil, and numerous small, isolated burial areas containing drums, liquids, paint sludges, and solvents with an estimated volume of 2,000 cubic yards (see Figure 2). Surface water resources which have been affected are the Slocum and Kimball Drains, which receive surface water from Berlin and Farro and empty into Swartz Creek. These surface water resources are not used for drinking water but are used for recreation purposes.

Site History

In April of 1971, Charles J. Berlin of Gaines Township obtained a permit from the State Air Pollution Control Commission (APCC) to install a waste incinerator at 8322 South Morrish Road. This permit allowed "trial" operation of the incinerator under specified air emissions restrictions and allowed for storage on site of up to 40,000 gallons of waste. Within six months, permission was obtained to bury solid wastes (particularly empty barrels) on the southwest corner of the site. The Berlin and Farro Liquid Incineration Company (Berlin and Farro) was formed in April 1972 with Mr. Berlin as President and Mr. Frank Farro as Treasurer.



LOCATION MAP



VICINITY MAP

Figure 1
LOCATION AND VICINITY MAPS

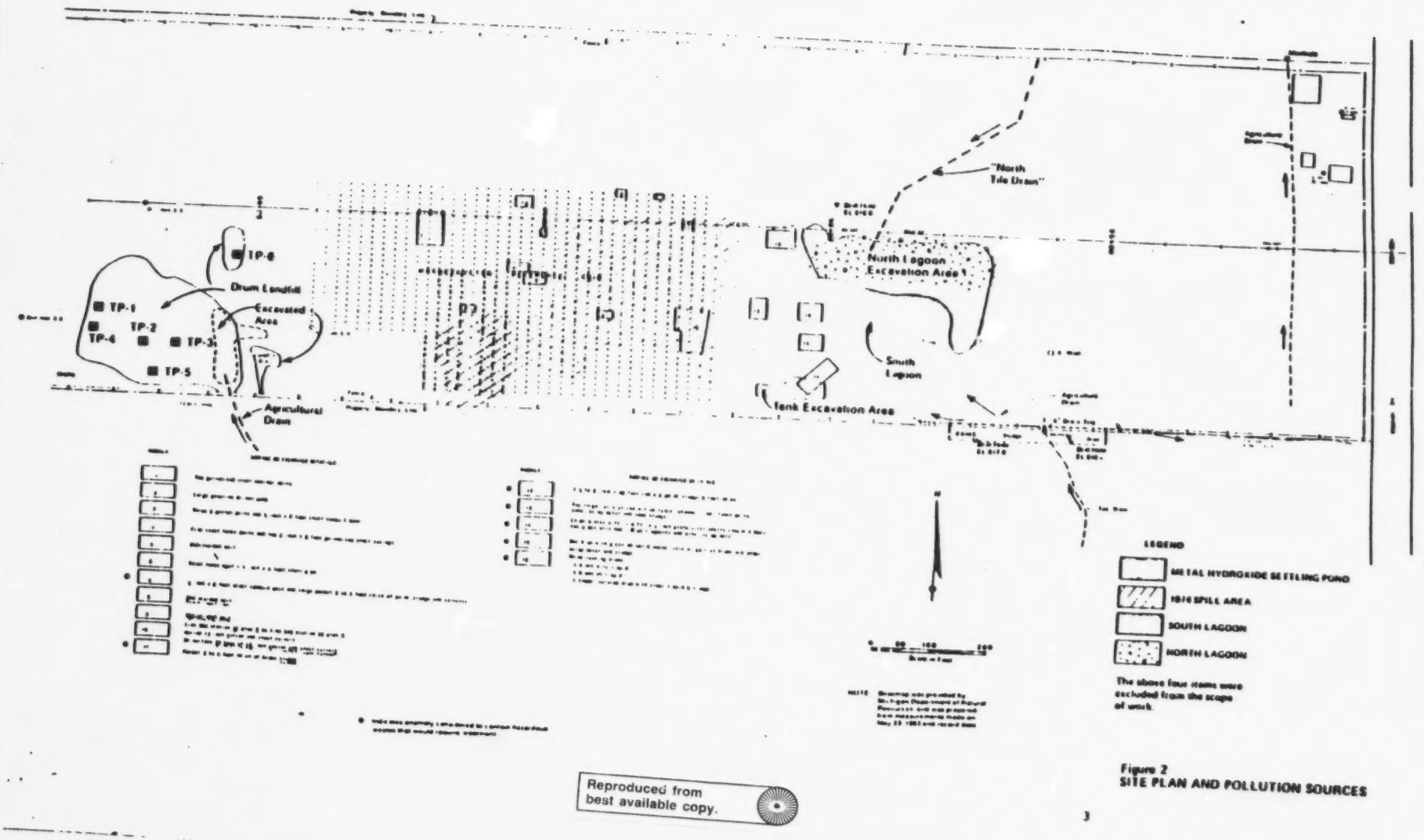


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Figure 2
SITE PLAN AND POLLUTION SOURCES

During 1973, several complaints were lodged against Berlin and Farro, primarily concerning smoke, odors, and other air pollution problems attributed to operation of the incinerator. These complaints resulted in action being taken against Berlin and Farro by both the State and Gaines Township. During a site inspection in July 1973, a county sanitarian found numerous liquid-filled drums in the landfill area, in violation of the landfill permit. The County Health Department and MDNR ordered immediate removal of these drums. This inspection record shows liquids were being improperly handled at the Berlin and Farro site as early as July 1973, indicating the potential for ground water contamination existed at least as early as that date.

Sometime in 1974, two unauthorized lagoons were constructed on site capable of storing up to 2.5 million gallons of liquid wastes. The county, in March 1974, discovered unauthorized ponds of oil and many overturned barrels which had spilled their contents on site. Berlin and Farro was cited for gross noncompliance and ordered to correct the problem. The State and County were able to document repeated contamination of Slocum Drain and adjoining drainageways throughout 1974.

The MDNR conducted a site inventory in August 1975 and discovered approximately 2,300 drums of liquid and solid wastes at the site. There were also nearly 1,000 empty drums, with additional drums accumulating at a rate of approximately 100 per week. In September 1975, the MDNR issued a "cease and desist" order against Berlin and Farro, but waste continued to be shipped to the site. One week later, Gaines Township obtained a temporary restraining order which shut down the operation. As far as is known, the landfill area of the site was not used again after 1975.

Berlin and Farro resumed operations in April 1976 under several stringent conditions imposed by MDNR. In spite of these conditions, Slocum Drain was found to be recontaminated in June and the lagoons on site were still in existence and full throughout 1976. In July 1977, C-56 (hexachlorocyclopentadiene) was discovered in underground storage tanks on site; it was also subsequently found in Slocum Drain early in 1978. At this time, PCB's were also discovered in the site lagoons.

Berlin & Farro submitted a cleanup plan to the State in July 1978 and initiated some cleanup work that month. The State sued Berlin and Farro, et al., in February 1979, seeking to expedite site cleanup work, and in June a preliminary injunction was obtained against Berlin and Farro. The lagoons were capped and some wastes were removed. Cleanup work stopped in late 1979. Title to a portion of the site was deeded to the State in 1980 for nonpayment of back taxes. Title to the remainder of the site was deeded to the State in 1981 for the same reason.

Berlin and Farro apparently continued to haul wastes to the site until July 1981, well after their operating permit had been revoked. In May 1981, the site was declared a toxic waste emergency by the State Toxic Substance Control Commission (TSCC). Subsequently, the Michigan state legislature appropriate $850,000 to conduct cleanup at the site. In November 1981 and December 1981, an action was conducted by the State to remove 15,300 cubic yards of C-56 containing lagoon sludge off site to a disposal facility.

In June 1982, acting on a request by the MDNR, U.S. EPA evaluated data supplied by the State which indicated a potential fire hazard existed in the landfill area at the site. These data reported flash point values of some wastes to be below 100°F, and some PCB wastes in excess of 10,000 ppm. This combination of factors led U.S. EPA to conclude an imminent threat to human health and the environment existed at this site. During June and July 1982, U.S. EPA, Region V conducted an immediate removal action at the Berlin and Farro landfill to fence the site and to excavate and remove aprproximately 30 drums not secured in the landfill. The approximate cost of this activity was $90,000.

On July 30, 1982, a Superfund cooperative agreement was awarded to the MDNR for $1,033,844. The Scope of Work of the cooperative agreement included a hydrogeological study, waste characterization, a feasibility study, underground tank removal, and lagoon capping.

In October 1982, under the cooperative agreement, the MDNR began the hydrogeologic study (contracted with D'Appolonia). The MDNR also began removal of five buried tanks containing approximately 10,000 gallons of C-56 contaminated liquid and removal of a total of 3,010 cubic yards of soil surrounding the tanks. This cleanup action was completed in June 1983.

In late 1982, the Michigan state legislature approved an additional $3,300,000 for cleanup activities. In January 1983, under a Genesee County Circuit Court order the MDNR began excavating lagoon sludges until work was postponed in March 1983, due to bad weather. Between April 1983 and July 1983, the MDNR spent $2,800,000 for removal and off-site disposal of lagoon sludges. The MDNR also spent approximately $350,000 for the excavation of approximate 3,600 drums in the landfill areas. The drums were sampled for waste characterization. By mid-July 1983, all of the available State funds had been utilized and the 3,600 excavated drums remained in piles on the surface of the landfill.

In July 1983, the U.S. EPA Region V determined that it was necessary to undertake emergency actions at the site and requested Headquarters approval of immediate removal funds. On August 17, 1983, $350,000 was approved for the removal of the 3,600 drums piled on the surface of the site. Work began on August 29, 1983, and consisted of removing the solid material from the drums, mixing the contents with on-site soils to raise the flash point and loading this material into lined and covered dump trucks for off-site disposal. The flammable materials found in the drums had a lower flash point than originally anticipated and consequently, the project scope had to be expanded and additional funding was necessary. On October 14, 1983, an additional $560,000 was approved and the immediate removal work was completed on October 28, 1983.

The scope of remedial activities conducted by the MDNR at the site has been modified continuously throughout the course of the cleanup, and has been perhaps most significantly impacted by a second Genesee County court ruling made on April 16, 1983. This court ruling ordered the MDNR to commence clean up activities immediately in the sludge lagoon area because this area was felt to represent the most serious potential for contamination. This order caused other site work, including the hydrogeologic study, to be delayed. The hydrogeologic study was also delayed by the drum excavation

and immediate removal activities conducted during the summer 1983. Field work for the hydrogeologic study was finally completed in early August 1983. The results of the draft report indicate that further ground water work is necessary to complete the hydrogeologic study.

Additional studies are also necessary to characterize other areas of contamination on the site. A feasibility study addressing the remainder of the site is also planned.

Current Site Status

Significant site features presently include drum landfills, "north" and "south" lagoons, metal hydroxide settling ponds, a 0.2-acre paint sludge trench, subsurface agricultural drains, the foundations of the liquid incinerator that has been removed, an area of contaminated soil at the former site of several underground tanks, and numerous isolated pockets of liquids, paint sludges, and solvents. The areas covered by the Focused Feasibility Study included the drum landfills, the .2 acre paint sludge trench, two of the four subsurface agricultural drains, and the numerous isolated pockets of liquids, paint sludges, and solvents. See Figure 2 for reference.

The following items were specifically excluded from the FFS scope:

- Two agricultural drains, one that drains north into the landfill, and another that drains south into the north lagoon. These drains were not included in the FFS because they drain towards contaminated area and are not likely to contribute to off site contamination.

- Contaminated soil and ground water at the site in general. For example, the FFS identified remedial actions for the contents of the drum landfill and soil immediately beneath the landfill; contaminated ground water and contaminated soil adjacent to the landfill will be considered in later studies.

- The lagoon areas and metal hydroxide settling ponds.

- Contaminated sediments in the existing on site stormwater retention ponds and in Kimball and Slocum Drains.

- Contaminated soil in the areas where buried tanks have been removed.

Each of the above areas will be covered in the subsequent RI/FS. Each of the areas covered in the FFS is described below.

Phasing of FFS Activities

As described above, the FFS evaluated several areas of the site including the drum landfill, paint sludge trench, agricultural drains, and several isolated areas of contamination. The alternatives developed in the FFS evaluate remedial actions dealing with the combined wastes from these areas. In order to develop and evaluate alternatives, volume estimates of various types of contaminated material were made using available data. These estimates included volume and type of wastes in the drum landfill and volume of contaminated sludge and soil under the landfill and in the other areas.

This approach was judged to be reasonable since it was not possible to determine the extent of contamination under the landfill, paint sludge trench or agricultural drains without first excavating the drums and sludge to expose the subsurface area for further sampling. Therefore, the alternatives described in the FFS and the following sections of this document are based on these estimated volumes. However, since the available data were not adequate to determine the extent of subsurface soil contamination, EPA and the State have determined that the recommendation of the FFS should be modified to implement the remedial action in phases. The first phase will include excavation and off-site disposal of the drum landfill, sludges in the paint sludge trench, agricultural drains, miscellaneous contaminated areas, and visibly contaminated soil. Existing data can adequately define the extent of this activity. Removal of the landfill and sludges is required to allow the State to conduct the necessary sampling in the subsurface soils and determine the actual extent of contamination. These new data will be evaluated and the recommendation of the FFS may be revised if necessary. Then, if appropriate, a new Record of Decision will be prepared to approve the additional measures to deal with the soils under the drum landfill, paint sludge trench, agricultural drains, and additional isolated contaminated areas.

The decision to proceed with the drum landfill at this time is also based on the need to complete the remedial action prior to the elevation of air temperatures during summer months. The organic wastes contained in the landfill will volatilize at a higher rate as air temperatures increase. If the remedial action is implemented during cooler months, the risks related to exposure of surrounding populations to volatilized organic contamination will be lessened.

Drum Landfill

The drum landfill consists of a large area (1.09 acres) and two small areas (0.04 acres and 0.06 acres) shown in Figure 2. The landfill contains mostly crushed drums buried 5 to 10 feet below the existing ground surface. These crushed drums typically contain waste sludge or contaminated solids, and each drum occupies about one-third the volume of a full 55-gallon drum. Based on test pits, the MDNR estimates that approximately 33,000 crushed drums are contained in the landfill.

The MDNR also reports the following landfill data:

- Approximately 35 percent of the crushed drums in the landfill contain solids with high PCB concentrations (greater than 50 ppm).
- The landfill contains approximately 1.6 million gallons of liquid wastes.
- Approximately 1 percent of the drums in the landfill are full and intact and may contain additional liquid wastes.
- The landfill could contain small quantities of liquid wastes with PCB concentrations greater than 500 ppm.

The total volume of solid waste in the drum landfill, including drums and visibly contaminated soil, is estimated at 28,000 cubic yards. One thousand cubic yards of solid waste with PCB concentrations greater than 50 ppm are estimated. The remainder of solid waste, 27,000 cubic yards, is estimated to have less than 50 ppm PCB. Available data indicates that soil contaminated by vertical migration of liquid wastes may exist several feet below the site. Additional testing will be required to determine the actual extent of contamination.

During the excavation conducted by the MDNR, 100 drum composites of sludge/solids, liquids, and oils were collected and analyzed. The MDNR documented the maximum concentrations of compounds, in parts per million (ppm):

TABLE 1

Maximum Concentration of Drum Composite Samples

Sample Category	Sludge/ Solid(ppm)	Oil(ppm)	Liquids(ppm)
Hexachlorobutadiene (C_{46})	14	2.0	650
Hexachlorocyclopentadiene (C_{56})	861	10.0	11,000
Octachlorocyclopentene (C_{58})	699	5.2	15,000
Hexachlorobenzene (C_{66})	110	29.7	120
PCB's Arochlor 1242	3500	.5	7300
Arochlor 1248	35	250.0	-
Arochlor 1260	7200	9.0	2400

Paint Sludge Trench

The paint sludge trench is located near the Berlin & Farro property line in the southeast portion of the site and occupies 0.2 acres. Based on visual observations from representative test excavations, the MDNR reports that sludge and contaminated soil extend 10 feet below (maximum) the existing ground surface. The total volume of sludge and visibly contaminated soil, based on a 10-foot-deep excavation, 25 feet wide at the bottom and 300 feet long, and having side slopes inclined at 45 degrees, is estimated at 3,900 cubic yards.

Agricultural Drains

Two subsurface agricultural drains are located in the eastern portion of the site. One drain is 1,200 feet long and consists of 4-inch-diameter perforated plastic pipe. The other drain is 600 feet long and consists of 4- to 10-inch-diameter clay pipe. The drains are currently filled with solid and liquid wastes, and the ends of the drains are plugged. Based on visual observations from representative test excavations, soil backfill surrounding the drains is contaminated. The volume of pipe and visibly contaminated soil is estimated at 3,300 cubic yards. The estimate is based on a 5-foot-deep excavation, 5 feet wide at the bottom and 1,800 feet long, and having side slopes inclined at 45 degrees.

Miscellaneous Contaminated Areas

Numerous small, isolated burial areas containing drums, drum fragments, liquids, paint sludges, and solvents have been identified by the MDNR using geophysical techniques. Some of these areas are expected to contain hazardous solid wastes and are identified with asterisks in Figure 2.

Because the depth and areal extent of miscellaneous contaminated areas are not clearly defined, volume calculations have been estimated. The volume of contaminated wastes and visibly contaminated soils is estimated to be two thousand cubic yards. Additional sampling will be required to determine if soils surrounding these areas are contaminated.

Routes of Exposure

The potential routes of exposure to the hazardous substances on-site are ground water, surface water, and air. As discussed earlier, two aquifers are affected by the releases at this site. The upper aquifer consists of glacial till, which is a heterogeneous mix of sand, silt, clay, gravel, and boulders. Within the till, lenses of sand and gravel occur, with water bearing capacity for domestic uses. Due to complex geologic and hydrologic conditions in this formation, ground water movement is not limited to one direction. Thus, there is a potential for contamination of the wells which exist in this aquifer.

The uppermost bedrock unit which occurs under the glacial materials is the Saginaw Formation, encountered at depths ranging from 125 to 156 feet. The Saginaw is composed of sandstone, shale, coal, and limestone. Beneath the Saginaw lies the Michigan Formation, consisting of shale, dolomite, and gypsum. Ground water occurs in both formations and is utilized for residential and commercial purposes. The bedrock formations are recharged by water which infiltrates through the highly permeable overlying glacial materials. Ground water movement is in a northwesterly direction, toward wells which exist in the area. No off-site ground water contamination has been documented; however, the presence of high concentrations of wastes at the site are a source of potential contamination due to infiltration through the wastes into the ground water.

Surface water resources which have been affected are the Slocum and Kimball Drains, which receive surface drainage from Berlin and Farro and empty into Swartz Creek (see Figure 2). These surface water resources are not used for drinking water purposes, but do serve a recreational function. Due to the volatile nature of the hazardous wastes on-site, releases of air contaminants into the surrounding environment is a major concern, particularly during cleanup operations. During the past cleanup activities, air monitoring stations were established around the perimeter of the site.

Enforcement

Negotiations for voluntary implementation of the selected remedial alternative by the potentially responsible parties (PRPs) are ongoing. A proposed Consent Decree was submitted by the PRPs on January 11, 1984. The Consent Decree includes a cleanup work plan developed by CECOS Environmental, Inc., the contractor selected by PRPs to conduct the site cleanup. EPA has

informed the PRPs that all of the terms of the Consent Decree must be agreed to, except for the scope of work, on or before the date of the award of the Cooperative Agreement. If EPA is unable to reach final agreement within this time frame, or if settlement discussions become unproductive and EPA terminates the discussions with the PRPs, Regional Counsel will recommend that an enforcement release be given.

Alternatives Evaluation

On August 31, 1983, a Focused Feasibility Study was completed that evaluated a limited number of alternative remedial measures for the drum landfill, paint sludge trench, two agricultural drains, and seven small miscellaneous contaminated areas. Detailed analyses and presentations of remedial investigation data were beyond the scope of the FFS. A hydrogeologic study initiated by the MDNR under the Superfund cooperative agreement was underway at the time of the FFS. The data that were available as a result of the on-going study and other prior data were utilized for the FFS. This included the following:

- The preliminary logs of soil test borings made in the vicinity of the drum landfill and the paint sludge trench;
- The logs of backhoe pits made at the landfill, the agricultural drains, and potentially a clay borrow area located north of the drum landfill;
- Atterberg limits, hydrometer and mechanical grain size analyses, permeability, and compaction tests on soil;
- A portion of the data from a geohydrological study of the entire site, which was still in progress;
- Soil resistivity, magnetometer, and ground penetrating radar surveys;
- Topographic maps;
- U.S. EPA priority pollutant scans on selected soil and ground water samples, sludge contained in crushed drums in the landfill, liquids contained in the landfill and north lagoon, liquids in the agricultural drains, and soil backfill around the agricultural drains;
- Analytical test results for PCB's and chlorinated organics for sludge samples from the paint sludge trench.

The conclusions derived from this remedial investigation data were used to develop and evaluate remedial action alternatives.

Alternatives and Initial Screening

There are several possible remedial actions for each contaminated area and each type of hazardous waste found on-site, as indicated below.

PCB and Non-PCB Solid Wastes

Contaminated Area	Remedial Action Alternatives
Drum Landfill and Paint Sludge Trench--32,600 Cubic yards	° No action ° Containment within a slurry trench & cap ° Disposal in new landfill on-site ° Disposal in an existing landfill off-site
Agricultural Drains and Miscellaneous Contaminated Areas--5,300 Cubic yards	° No action ° Flushing and cleaning (agricultural drains only) ° Disposal in a new landfill on-site ° Disposal in an existing landfill off-site

Non-PCB Liquid Wastes

Contaminated Area	Remedial Action Alternatives
Liquids contained in the Drum Landfill--1.6 million gallons	° No action ° On-site treatment ° On-site solidification ° Off-site disposal

Potential alternatives were discussed with EPA and MDNR during the project kickoff meeting to develop all reasonable alternatives. These alternatives were included in the FFS and initial screening further reduced the list of alternatives to those that were subsequently evaluated for cost-effectiveness. A discussion of remedial action alternatives that were dropped in the initial screening process follows.

The no-action alternative for PCB and non-PCB solid waste and for non-PCB liquid waste was eliminated during the initial screening process because of the long-term potential for additional contamination of the soil, ground water and surface water off-site. Factors contributing to this potential contamination include:

- A shallow ground water table that is in contact with wastes in the drum landfill, paint sludge trench, agricultural drains, and miscellaneous contaminated areas;
- Sand lenses in the subsurface profile that cause a relatively high soil permeability in the horizontal direction;

- The absence of any liner or leachate barrier on the bottom or sides of the drum landfill, paint sludge trench, and miscellaneous contaminated areas;

- The proximity of Kimball and Slocum Drains.

The initial screening process also eliminated the slurry trench containment alternative for the drum landfill and the paint sludge trench. The primary reason for its elimination was extraordinarily high capital and O&M costs. O&M costs include the treatment of liquid waste collected over a 30-year project life, estimated at 80 million gallons.

In the initial screening process, cleaning and flushing the agricultural drains was considered inadequate and eliminated, since liquid wastes and some solid wastes inside the pipes would be removed; however, contaminated soil surrounding the pipes would remain. These contaminants would continue to leach to the local ground water and surface water, and threaten public health and the environment.

After the initial screening process, the following remedial action alternatives remained:

PCB and Non-PCB Solid Wastes

Contaminated Area	Remedial Action Alternatives
Drum Landfill, Paint Sludge Trench, Agricultural Drains, and Miscellaneous Contaminated areas--37,900 Cubic yards	° Disposal in a new landfill on-site ° Disposal in an existing landfill off-site - Facility A (In-State) - Facility B (Out-of-State)

Non-PCB Liquid Wastes

Contaminated Area	Remedial Action Alternatives
Liquids contained in the Drum Landfill—1.6 million gallons	° No action ° On-site treatment - Discharge to Slocum Drain - Discharge to Flint, MI, STP ° On-site solidification ° Off-site disposal - Facility A (In-State) - Facility B (Out-of-State) - Facility C (Incineration Out-of-State)

Evaluation of Alternatives

As noted, the initial screening process eliminated the no-action, slurry trench, and the cleaning and flushing remedial action alternatives. Screening also eliminated all but one alternative for PCB solid wastes--off-site disposal at Facility B. Disposal of PCB wastes on-site would require construction of a disposal facility in compliance with TSCA for PCB concentrations between 50 ppm and 500 ppm. Incineration would be required for wastes above 500 ppm. Off-site disposal was the only alternative that would allow disposal at a facility permitted to receive PCB contaminated wastes. The cost of PCB disposal at Facility B is estimated at $4.6 million.

After initial screening, several viable options for non-PCB solid and liquid wastes remained, as listed above. EPA first evaluated the costs of these options. These costs are arrayed in Table 2. For solids, consideration of costs led to elimination of the alternative of disposing of the wastes at Facility B for which costs are markedly higher than either on-site disposal or off-site disposal at Facility A. The costs of the remaining alternatives, on-site disposal or off-site disposal at Facility A, are virtually indistinguishable, given the statistical confidence limits of the cost estimates.

For liquids, consideration of costs resulted in the elimination of the two alternatives requiring on-site treatment and discharge. Each of these alternatives was two to three times the cost of the other disposal alternatives.

EPA next considered the environmental effectiveness of the remaining alternatives. For solids, the relative effectiveness of on-site versus off-site disposal is a close call, since either method would involve disposal in a secure facility designed to comply with RCRA requirements. However, two factors suggest that off-site disposal is the more effective alternative. First, the high ground water table and permeable subsurface soils characteristic of the Berlin and Farro site are generally not suitable for construction of an on-site disposal facility, so long as there is another viable cost-effective alternative for disposal. Although an on-site facility would be designed to guard against releases, these hydrogeologic characteristics would multiply the adverse effects of any failure of the facility. Second, removal to an off-site facility can be accomplished faster than construction and disposal on-site. The presence of volatile compounds, such as C-56, in the sources designated for removal, and experience at the site, demonstrate a need for expeditious removal. Warmer weather will cause these compounds to volatilize at a higher rate, presenting a tangible health threat to nearby residents. Indeed, it was similar conditions that caused MDNR to evacuate the area during removal operations conducted in the summer of 1983.

Therefore, in light of the comparable costs of on-site and off-site disposal, and the predicted greater effectiveness of off-site disposal, off-site disposal is a more cost-effective remedy, and is the recommended alternative for solids.

The same considerations discussed above demonstrate that off-site disposal of liquids is more effective than on-site dispoal. Additionally, disposal of liquids in a landfill either on- or off-site, would require solidification of the wastes. EPA's experience with such methods is that solidification does not necessarily stabilize liquids containing organic compounds. Therefore, the most effective available alternative for liquid

wastes is off-site transport and incineration at Facility C. Since the costs of this alternative are comparable to the costs of on-site or off-site disposal, it is the most cost-effective alternative and is recommended.

EPA's analysis was generally confirmed by the analysis performed in the FFS. The criteria used in the FFS to evaluate alternatives might have understated to some degree the effectiveness of on-site disposal. However, the analysis in the FFS does demonstrate the closeness of on- and off-site remedies, and supports EPA's selection of the cost-effective alternative. The cost-effectiveness evaluations used in the FFS are described below.

Evaluation Procedures

A cost-effectiveness ranking procedure was used that considered level of cleanup provided, construction time required, community acceptance, public health and environmental impacts during construction, technical feasibility, land use impacts, risk of failure, and compatibility with other remedial actions. This evaluation procedure is described in an article entitled "Evaluating Cost Effectiveness of Remedial Actions At Uncontrolled Hazardous Waste Sites-Draft Methodology Manual," prepared for the Municipal and Environmental Research Laboratory, U.S. EPA, by Radian Corporation, January 10, 1983 (DCN 83-203-007-60-70).
The following steps summarize the evaluation procedure.

1. Remedial action alternatives were listed in the evaluation table (Table 2), along with effectiveness measures, and weighting factors. Weighting factors shown are those suggested by Radian Corp.

2. Initial costs and the present worth of O&M costs were estimated for each alternative and listed in the table.

3. Alternatives were evaluated using each effectiveness measure, then ranked on a scale of 1 to 5 (with 5 being the best score).

4. Scores for each effectiveness measure were multiplied by the appropriate weighting factor, then added for each alternative. This produced the "total weighted efficiency rating."

It is recognized that this evaluation and ranking procedure, as does every other available evaluation procedure, requires subjective judgment. Scores for each alternative have been assigned based on engineering judgment. Nevertheless, if consideration of factors other than cost is to be included in the evaluation process, a certain amount of subjective judgment is required. A detailed description of this procedure is included in the FFS.

Estimated costs and alternative scores selected for the Berlin & Farro site are shown in Table 2 and discussed below.

Estimated Costs

Cost estimates have been prepared for remedial action alternative evaluations based on available information. The final cost of the project will depend upon actual labor and materials unit costs, material quantities, competitive market conditions, final project scope, implementation schedule,

TABLE

Efficiency Rating

Alternative	Effectiveness Measure Scores										Estimated Cost (millions of dollars)		
Weighing Factor:	Level of[a] Cleanup 1.0	Time Required[a] 0.5	Community Acceptance[a] 0.6	Health and Environmental Impacts During Const.[a] 0.7	Technical Feasibility[a] 0.6	Land Use Impact[a] 0.4	Risk of Failure 1.1	Compatability With Other Activities[a] 0.5	Total Weighted[d] Effic. Rating	Alternative[f] Ranking	Design/ Construction	Monitoring/ Operations/[b] Maintenance	Total Cost[c]
Solids													
New On-site Landfill	4	2	3	4	4	2	4	4	19.2	3	3.24	0.16	3.4
Existing Off-site Landfill (Facility A)	5	5	5	4	5	5	5	5	26.3	1	3.87	0	3.87
Existing Off-site Landfill (Facility B)	5	4	5	4	5	5	5	5	25.8	2	11.78	0	11.78
Liquids													
On-site Treatment Stream Discharge	4	3	3	3	4	4	4	4	19.8	5	1.58	0	1.58
On-site Solidification[e]	4	2	3	3	2	2	3	4	16.2	3	0.86	0	.86
On-site Treatment, Flint SIP Discharge	5	3	4	3	4	4	4	4	21.4	4	1.59	0	1.59
Off-site Disposal (Facility A)	5	5	5	4	5	5	5	5	26.3	1	.56	0	.56
Off-site Disposal (Facility C)	5	5	5	4	5	5	5	5	26.3	1	.58	0	.58

[a] 1 = Worst
5 = Best

[b] Operations and maintenance costs have been separated from total costs.

[c] Present worth value, does not include PCB solid removal. Cost of PCB removal is estimated at $4.6 million.

[d] Alternative score times weighing factor, (Example: New on-site landfill: 4 x 1 + 2 x .5 + 3 x 6...+ 4 x 1.1 + 4 x .5 = 19.2).

[e] Assumes new landfill in built on site

[f] 1 = Best
5 = Worst

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and other variable factors. Project feasibility and funding needs must be carefully reviewed before specific financial decisions are made, to help assure proper project evaluation and adequate funding.

The estimates presented herein are "order-of-magnitude" as defined by American National Standards Institute (ANSI) Z94.2 and the American Association of Cost Engineers. It is normally expected that an estimate of this type will be accurate within + 50 percent and - 30 percent. These percentages should be viewed as statistical confidence limits and must not be confused with contingencies.

Alternative Scores

Scores of 1 and 5 in Table 2 represent the extremes for the alternatives: 1 is the worst and 5 is the best. Intermediate values between the 1 and 5 were used to rate an alternative relative to the others for that particular effectiveness measure. Intermediate values are subjective, based on experience and engineering judgment.

Scores were assigned in terms of the Berlin & Farro site. For example, when comparing the level of cleanup for off-site and on-site disposal alternatives, in both cases, the wastes are contained in hazardous waste landfills and are relatively isolated from the environment. However, wastes remain on-site with the on-site alternative, and there will always be a potential for future contamination since the wastes would be contained in permeable ground water recharge areas. On-site alternatives were, therefore, ranked lower. Similarly, when impacts of failure are compared, the risk of failure for wastes contained off-site is lower. Although the risk of failure for each alternative should be the same, the impact of failure is greater for on-site disposal since the containment structure would be in contact with ground water at the site. Thus, on-site alternatives were ranked lower.

Level of Cleanup Provided

The level of cleanup is based on removal of the contaminants from the site with 1 given to no removal and 5 given to complete removal. Even though the contaminants will be contained in a hazardous waste landfill, on-site disposal alternatives were ranked lower than off-site alternatives because the contaminants remain on-site and, given the hydrogeologic conditions at the site (e.g. the on-site landfill would be in direct contact with the ground water) there would always be a potential for future contamination of the ground water.

Construction Time Required

A 5 was assigned to alternatives that could achieve the quickest (3 to 5 months) mitigation of continued migration of wastes from the site and a 1 to those that would take longer than 5 years. Removal to Facility A or Facility C was considered the quickest (3 months), whereas removal to Facility B was expected to take more time (9 to 12 months) because of the considerably longer haul. On-site disposal and treatment alternatives are expected to be the longest (1 to 3 years) because of the construction time, permitting that may be necessary for the new landfill, on-site treatment facilities, and effluent discharge.

Community Acceptance

Those alternatives that had no long-term impact on the community were assigned a 5 whereas those that caused a continued or permament change to the normal way of life were assigned a 1. Off-site disposal alternatives were assigned a 5 because, once the wastes are removed, the site can potentially be reclaimed. On-site disposal alternatives allow only limited reclamation, and a new hazarodus waste landfill on-site would likely have psychological impacts. On-site disposal alternatives were given a 3.

Health and Environmental Impacts During Construction

A 1 would be assigned to alternatives with severe health and environmental impact during construction and a 5 to those with none. All the alternatives have some health and environmental impacts during construction, so none was assigned a 5. Alternatives for solid wastes were all rated the same--4. On-site treatment alternatives for liquid wastes were considered to have a greater impact on health and the environment than off-site disposal because of waste gases from the air stripper, and because the on-site treatment system is more complex than the relatively simple pumping of liquid waste materials.

Technical Feasibility

Those alternatives that are relatively simple, easily designed and constructed, and are proven methods were assigned a 5, whereas complex, difficult, and unproven methods were given a 1. The off-site alternatives were given a 5 because existing facilites are experienced in the treatment of wastes and have a history of performance. On-site alternatives were rated less because there is no history and there is a potential for problems during the initial operation. On-site solidification was rated the lowest because of the lack of knowledge of the long-term leaching properties of solidified liquid wastes.

Land Use Impacts

Those alternatives that completely prevent the desirable use of the site were given a 1 and those that allowed the unrestricted use of the site were assigned a 5. Off-site alternatives were ranked a 5 because after the site has been reclaimed use of the land would be essentially unrestricted. On-site alternatives would restrict the future use of the site and were ranked lower.

Risk of Failure

Those alternatives with a high risk of failure (the possibility of failure coupled with the consequences of failure) were given a 1. Those alternatives considered fail-safe were given a 5. Off-site alternatives were assigned a 5 because with the waste off-site the possibility of failure and consequences of failure are nonexistent, relative to the Berlin and Farro site. On-site alternatives were therefore, ranked lower than off-site alternatives since the possibility of failure does exist when the wastes are contained on site.

Compatibility with Other Remedial Activities

A 5 was given to those alternatives that were completely compatible with other activities and a 1 given to those that completely interfered or caused a loss of economy. For the most part, all alternatives were relatively compatible. On-site alternatives created some disruption during construction and were ranked lower.

Community Relations

A public meeting was held on June 6, 1983, at the Gaines Township Hall at the start of the Focused Feasibility Study. The purpose of the FFS, expected accomplishments, the alternatives likely to be analyzed, other actions planned for the site, and other issues raised were discussed. A subsequent meeting was held on September 14, 1983, to present the draft FFS and to solicit comments. Verbal comments received at the meeting supported the selected alternatives. Various types of media (eg. newspaper ads, fact sheets, radio) were utilized to notify the public of these meetings. Representatives of U.S. EPA, State and local governments and the community were all well represented. Copies of the FFS were provided, with a thirty (30) day comment period. A comprehensive Community Relations Program is planned for the FFS implementation. A copy of the responsiveness summary is attached.

Potentially Responsible Party Comments

The potentially responsible party (PRPs) submitted a cleanup work plan developed by CECOS Environmental Inc. to EPA and the State. This plan has been reviewed to determine if any technical components differ from the proposed remedial action recommended by EPA and the State. It was determined that the CECOS plan is technically consistent with the proposed action since all proposed remedial activities are also included in the CECOS plan, and since the CECOS plan recommends the remedial alternative adopted in this Record-of-Decision. The major difference is that the CECOS plan includes additional cleanup activities that are not recommended by EPA and the State at this time. As noted earlier, these additional activities will be addressed in a future RI/FS.

Consistency with Other Environmental Requirements

The proposed action will not require on-site treatment, storage, and disposal of hazardous wastes. Therefore, there are no issues involving the consistency of on-site actions with RCRA. Off-site disposal of wastes will be in accordance with the appropriate RCRA regulations for the transportation and disposal of hazardous wastes. This will include manifesting of wastes and shipment to a RCRA approved facility. Disposal of PCB wastes will be at a TSCA permitted facility. Residual contaminated soil that may be found under the drum landfill or other areas will be managed in future remedial actions. Appropriate RCRA technical regulations will be used if remedial alternatives are evaluated in the remaining RI/FS to be conducted by EPA.

Recommended Alternative

Section 300.68 of the National Oil and Hazardous Substances Contingency Plan (NCP) states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial measure which the agency determines is cost-effective (i.e. the lowest cost alternative that is technologically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment. Based on the evaluation of the cost and effectiveness of each proposed alternative, the comments received from the public and the MDNR, the following alternative has been determined to be cost-effective as defined by the NCP:

- Excavate the existing drum landfill and dispose of sludge, crushed drums, liquid wastes and visibly contaminated soil at an approved off-site facility.

- Excavate the paint sludge trench and dispose of sludges and visibly contaminated soil at an approved off-site facility.

- Excavate the agricultural drains leaving the site and miscellaneous areas of visible contamination, and dispose of wastes, sludge and visibly contaminated soil at an approved off-site facility.

The remedial action also includes installation of a temporary cap if it is determined that additional actions are needed to address contaminated soil under the areas. If no additional actions are needed, the areas will be backfilled with uncontaminated, relatively impervious soil.

The recommended action is considered a source control measure as defined in section 300.68(e) of the NCP. The objective of the action is to remove potential sources of continued migration of wastes from the site. This includes liquid and solid wastes, sludges and visibly contaminated soils. Residual contamination that may exist beyond these areas will be investigated in a future RI/FS to be conducted by EPA. That RI/FS will determine if additional remedial actions are needed to address remaining soil and ground water contamination on-site and will develop the appropriate level of cleanup. Determining the appropriate extent of future remedial actions was beyond the scope of the FFS.

The evaluation of alternatives for source control measures determined that off-site disposal of the hazardous wastes was more cost-effective than feasible on-site alternatives. On-site disposal of solid and liquid waste was found to be slightly more expensive (less than 5 percent more, see Table 2). Given the statistical confidence limits of these estimates, the costs of on-site and off-site disposal are nearly indistinguisable. Morever, off-site disposal was determined to be more cost-effective when the effectiveness measures were considered. On-site treatment of liquids required solidification which has not been proved reliable. This could result in leaching of organics over time if wastes are left on-site. In addition, although construction of an on-site disposal facility would be in compliance with appropriate RCRA regulations, the high ground water table and permeable subsurface soils are generally not suitable for

construction of a land disposal facility. The risk of failure for an on-site facility should be the same as for an off-site facility; however, the impact of failure of an on-site facility would be greater due to the unsuitable hydrogeologic conditions documented in the MDNR's hydrogeologic investigation. Finally, the shorter time needed to dispose of the wastes off-site (3 months versus 1 to 3 years) also points to off-site disposal as a more effective alternative, particularly since the wastes will be removed prior to warmer weather, which would cause organic wastes to volatize at a higher rate. Therefore, the increased effectiveness associated with off-site disposal outweighs the slight increase in cost if any, of off-site compared to on-site disposal.

Off-site disposal of all solid wastes will be at approved facilities. Non-PCB wastes will be disposed at a facility that complies with RCRA. PCB solid wastes will be disposed at a facility permitted by TSCA. Additionally, EPA will review the facility selected by the State to ensure that conditions similar to those present at Berlin and Farro do not exist. Samples collected by MDNR indicated small quanties of liquid PCB wastes. Since data did not indicate an estimatable quantity of liquid PCBs, no alternative for these wastes were evaluated. However, the cost estimates for each alternative includes a contingency for disposal of liquid PCB wastes, if found. Liquid PCB wastes will be incinerated, as will non-PCB liquid wastes.

The recommended remedy also includes off-site disposal of liquid wastes from the drum landfill. Table 2 shows that off-site disposal of liquids is less costly than on-site alternatives. The FFS recommended off-site disposal at Facility A as the cost-effective method of disposal for liquid wastes. However, the factors used to evaluate alternatives did not distinguish between the effectiveness of disposal and destruction. Disposal of wastes, even when in conformance with appropriate regulations, leave the wastes in the environment with the possibility of future release. Destruction by incineration will permanently remove wastes from the environment and eliminate any possibility of future migration. Off-site disposal at Facility A is slightly less expensive than off-site incineration at an approved facility (less than 5 percent difference in cost, see Table 2). However, the cost of incineration is still lower than on-site disposal of liquids, and when considering the higher level of protection provided by destruction rather than disposal, incineration of liquid wastes is more cost-effective than other methods of off-site disposal.

The estimated costs for the recommended action are:

Site Area	Estimated Cost
Drum Landfill	
Non-PCB Solid Waste	$2,955,813
Non-PCB Liquid Waste	564,800
PCB Solid Wastes	4,608,737
Total Drum Landfill	8,129,350
Paint Sludge Trench, Agricultural Drain and miscellaneous areas	$ 953,856
Total Estimated Cost	$9,083,206

Schedule

- Complete Enforcement Negotiations	February 14, 1984
- Approve Remedial Action (Sign ROD)	February 15, 1984
- Issue CERCLA 106 Order	February 17, 1984
- Enforcement Release	March 9, 1984
- Amend Cooperative Agreement	March 9, 1984
- Start Construction*	March 12, 1984
- Complete Construction	August 10, 1984

* Design completed by the MDNR at its own expense in November 1983.

Future Actions

An additional remedial investigation/feasibility study will be conducted to determine the extent of soil and ground water contamination for those areas of the sites not yet addressed. This activity will be a federal-lead project and will be initiated in March 1984, and completed by December 1984.

Responsiveness Summary

Public Comments on Focused Feasibility Study, Berlin & Farro, Swartz Creek, Michigan

The Focused Feasibility Study (FFS) for the Berlin & Farro hazardous waste site near Swartz Creek, Michigan was completed on August 31, 1983. Copies of the FFS were made available at the Gaines Township Hall near the site and mailed out to interested parties by the Michigan Department of Natural Resources (MDNR). A public meeting was held at the Gaines Township Hall on September 14, 1983, to present the FFS and solicit comments. Verbal comments received at the meeting supported the selected alternatives.

Written comments were received from six parties: a Michigan State Senator, the MDNR and four businesses. Region V is reviewing and responding to the comments from all the parties.

A summary of the significant comments and responses are presented below.

Several commenters stated that the Agency could not prepare a feasibility study covering only a portion of the site. The commenters feel that all remedial investigation work must be completed and then one study prepared. The Agency's response is that the National Contingency Plan (NCP) does not call for a feasibility study for an entire site. The NCP calls for an evaluation of alternatives for hazardous substances. The Agency has decided that discrete areas with hazardous substances may be investigated, remedial alternatives evaluated, and remedies implemented while other areas at a site are still in the planning phase. This allows for an acceleration in implementing remedial measures to limit exposure or threat of exposure to a health or environmental hazard. A FFS is the evaluation of alternatives for these discrete areas of hazardous substances.

Several commenters felt that the hydrogeological investigation must be complete before a decision can be made regarding on-site disposal methods. The Agency's response is that while the hydrogeological study was not complete when the FFS was finalized there was sufficient data available from the hydrogeological study on which to base decisions regarding alternative evaluation and selection.

Several commenters felt that the off-site disposal facilities should be identified and arrangements made for disposal capacity. The Agency's response is that the selection of the off-site disposal facility will be made by the cleanup contractor bidding on the project, subject to Agency and MDNR approvals. Disposal facilities are not identified in the FFS since competition among cleanup contractors and disposal facilities is encouraged to provide the lowest cleanup cost while still protecting public health and the environment.

One commenter felt that the FFS adequately addressed the needs for remedial measures at the site and that implementation of the remedy should proceed.